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[MTD 10: Precious Metals]

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Indian Standard

BIMETALLIC TAPE FOR ELECTRICAL CONTACTS — SPECIFICATION

भारतीय मानक

विद्युतीय सम्पर्क के लिए द्विधात्विक टेप — विशिष्टि

UDC 669 - 419·4 : 621·39

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

March 1990

Price Group 1

Precious Metals Sectional Committee, SMDC 13

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards on 25 May 1989, after the draft finalized by the Precious Metals Sectional Committee had been approved by the Structural and Metals Division Council.

Bimetallic tapes are widely used in the construction of contact assemblies for telecommunication relays and exchange systems, domestic thermostats, automobile and domestic switches. The materials are selected for contact portion depending on light or medium duty. These are platinum, palladium, gold and silver, and their alloys.

Testing of solid contacts has shown that around 50 percent of the expensive precious metal is necessary for satisfactory performances of the contact. The backing material may be of a cheaper base metal, such as, phosphor bronze, copper-nickel alloy, etc. The backing material mostly depends on its subsequent application. The usual backings are 70/30 brass, 80/20 copper nickel and phosphor bronze.

The tapes are manufactured in continuous unwelded lengths integrally bonded to achieve 100 percent bond between contact material and the base metal. The tapes are manufactured in a variety of shapes and sizes to closely controlled tolerances. Along the base of the tape is a continuous projection or pattern of projection that simplifies the welding of contacts during contact assembly.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

BIMETALLIC TAPE FOR ELECTRICAL CONTACTS — SPECIFICATION

1 SCOPE

1.1 This standard covers silver-palladium bimetallic tape used in telecommunication industry, for the rotary dial, as a contact to be welded on the spring.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
IS 1387 : 1967	General requirements for the supply of metallurgical materials (*first revision*)
IS 1501 (Part 1) : 1984	Vickers hardness test for metallic materials: Part 1 HV 5 to HV 100 (*second revision*)
IS 1501 (Part 2) : 1984	Vickers hardness test for metallic materials: Part 2 HV 0·2 to less than HV 5 (*second revision*)
IS 1501 (Part 3) : 1987	Vickers hardness test for metallic materials: Part 3 Less than HV 0·2 (*second revision*)

3 SUPPLY OF MATERIAL

3.1 General requirements relating to the supply of material shall conform to IS 1387 : 1967.

4 CHEMICAL COMPOSITION

4.1 The material used for the tape shall be as given in Table 1.

5 MECHANICAL PROPERTIES

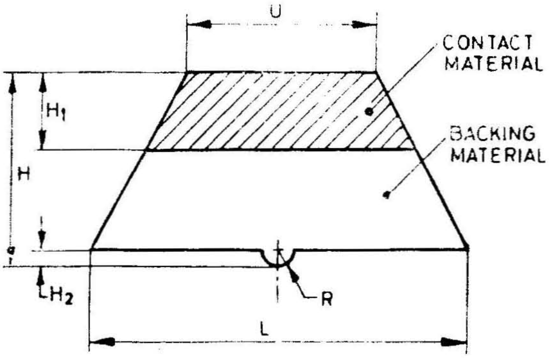
5.1 The hardness of the precious metal side shall be between 120 to 160 HV when tested in accordance with IS 1501 (Parts 1 to 3).

5.2 Torsion Test

A sample each of about 150 mm from both ends of the coil is taken. The sample is twisted unidirectionally until it breaks. Clamping is done leaving 100 mm length free between grips. The surface is observed for cracks. Except at the fracture, there shall be no signs of crack or flaw on the surface. Two tests shall be done.

6 DIMENSIONS AND TOLERANCES

6.1 Dimensions and tolerances shall be as given below (*see* Fig.):



Symbol	*Size* mm	*Tolerances* mm
U	0·5	±0·02
H_1	0·2	
H	0·5	
L	1·0	
R	0·08	
H_2	0·08	

6.2 Tape length shall be as per the order received from the purchaser.

7 FREEDOM FROM DEFECTS

7.1 There shall be no crack or flaw on the surface, observed after the torsion test. The surface shall have a bright and smooth finish.

8 PACKING

8.1 The material shall be suitably packed to prevent any transit damage and corrosion. It may be wound round a spool, the size of which shall be mutually agreed to between the supplier and the purchaser.

9 TEST CERTIFICATE

9.1 Quality test certificate shall accompany the supply, giving full test results.

10 MARKING

10.1 Description, quantity, manufacturer's name or trade-mark and purchase order reference shall be marked.

Table 1 Chemical Composition

(*Clause* 4.1)

Material	**Alloy**	**Impurity Limits**
	Percent	Percent
a) *Contact Material*		
Silver-palladium alloy	Silver: 50 ± 1 Palladium: 50 ± 1	0·15, *Max*
b) *Backing Material*		
1) Brass	Copper: 68·5-71·5 Zinc: Remainder	Lead: 0·05, *Max* Iron: 0·05, *Max* Total impurities: 0·3, *Max* (including iron)
2) Copper-nickel	Copper: 79·0-81·0 Nickel: 19·0-21·0 Manganese: 0·05-0·50	Lead: 0·01, *Max* Iron: 0·30, *Max* Sulphur: 0·02, *Max* Carbon: 0·05, *Max* Total impurities: 0·35, *Max*
3) Phosphor bronze	Tin: 5·5-7·5 Phosphorus: 0·20-0·40 Copper: Remainder	Lead: 0·02, *Max* Zinc: 0·30, *Max* Total impurities: 0·50, *Max*

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